

### **Experimenting with Pig-based Skin Model for Burns. Testing of Mean Literature Findings**

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### **Abstract**

*Introduction:* Animal models that closely mimic human burn wound healing processes are essential for developing effective burn wound treatments. Pigs are useful animal models for studying burn wound healing. From their extensive literature review, Andrews and Cuttle (2017) reported mean temperature and exposure time values. This study was done to provide initial burn depth for another experiment comparing two burn wound treatments. The secondary goal was to validate a systematic review on porcine burn model standardization.

*Materials and Methods:* Six four-week-old Large White x Landrace gilts were housed in a closed structure for 10 days to acclimatize. The procedures were performed under general anesthesia. A round 2.5 cm copper plate welded to an aluminum rod with a wooden handle caused the injuries. The burning device was used to reach a contact temperature of 110°C on the pig's skin. The objective was to create a superficial partial thickness (SPT) burn for 10 seconds (Group 10s) and a deep partial thickness (DPT) burn for 20 seconds (Group 20s) using a plate heated at 110°C. No stabilizer or pressure controller was used. Wounds were conclusively dressed and harvested 24 hours later. The usual hematoxylin-eosin protocol was used to cut and stain 4-micron sections.

*Results:* A significant difference ( $p < 0.01$ ) was observed in dermis involvement, with a mean of 85.61% (95% CI= 80.62 to 90.61) for group 10s and 123.71% (95% CI= 114.91 to 132.50) for group 20s. An exposure time of 20 seconds increased dermis depth-related total collagen denaturation by almost 50% compared to 10 seconds.

*Conclusions:* In conclusion, our experiment produced DPT burns in 10 seconds and FT burns in 20 seconds without a pressure application device.

**Key words:** model, animal, burns, porcine